

METAMORPHOSES OF CUBAN HESPERIINÆ

BY V. G. DETHIER

Biological Laboratories, Harvard University

INTRODUCTION

As is generally the case when the life histories of skippers are studied, members of the subfamily Pyrginæ receive most attention while the Hesperiinæ are almost totally neglected. This situation is difficult to understand for though larvæ of the Pyrginæ are admittedly more spectacular and more frequently encountered in the field, a satisfactory treatment of their life histories is rendered difficult by several factors not the least of which is the fact that gravid females do not readily oviposit in captivity. Again, in many instances the food plant is unknown. On the other hand, Hesperiinæ oviposit on the least provocation, and the larvæ can be reared practically upon any grass. It is all the more surprising that the metamorphoses of Cuban Hesperiinæ have suffered neglect since all species can undoubtedly feed on sugar cane. Those species treated in this paper readily did so and the Hesperiinæ include not a few potential sugar cane pests.

Of the twenty-two species listed in this subfamily by Bates (1935) the life histories of but half are now known. Species which also occur in the United States have been studied by workers there. Gundlach (1881) recorded two additional species, and six species are treated below.

This work was made possible by my receiving a Harvard University Fellowship to study at the Atkins Institution of the Arnold Arboretum at Soledad, Cuba. The incompleteness of some of the life histories is due in part to the limited time available for study in Cuba. Color descriptions are based on a comparison with Ridgway's (1920) color charts.

It is a pleasure to acknowledge the generosity of Professor Thomas Barbour and the cheerful assistance of Mr. Frank Walsingham.

Polites baracoa (Lucas)*Egg.*

Height .5 mm. Greatest diameter .7 mm. Yellow when laid, later becomes flesh color due to the appearance of blood red coloring in the fine raised reticulation present over the surface of the egg.

First Instar.

Head height .4 mm.; head width .37 mm. Head deep piceous. Shallowly punctate. Shield same color. Length of body 1.5 mm. Body yellow at emergence; after eating, tinged with grass green. Clothed with short distinctly clavate hairs. Anal segment with two pairs of long forwardly recurved hairs and a shorter pair of backwardly decurved hairs. Spiracles very faint fuscous. Legs fuscous.

Second Instar.

Head height .7 mm.; head width .6 mm. Head lighter piceous than before, with more numerous short colorless hairs. Head roughly punctate. In some specimens there are light areas in the regions of the epicranial and adfrontal sutures. Body length 2.4 to 4 mm. Body light green covered with many short colorless to brown hairs. Anal plate gray.

Third Instar.

Head height .9 mm.; head width .85 mm. Head roughly punctate. Slight evidence of light areas characteristic of later instars (cf. Fig. 10). Length of body 5.5 mm. Green dorsally, yellow laterally and ventrally. Covered with numerous short black hairs. Anterior two thirds of anal plate gray with a roughly spherical light area on either side of the median line. Posterior third of anal plate a much lighter gray.

Fourth Instar.

Head height 1.1 mm.; head width 1.1 mm. Head coarsely shagreened. Characteristic piceous design on a very light fuscous background (Fig. 10). Margin of foramen magnum piceous. Body length 6.5 to 8 mm. Mid-dorsal line dull green. Paradorsal lines mottled with light and dark green. Intersegmental areas brownish. Spiracles light cream. Short hairs covering body arising from small black warts. Dark

gray area of anal plate of greater extent. Light spots more elongate.

Fifth Instar.

Head height 1.4 mm.; head width 1.5 mm. Piceous design reduced in area. Ground color Old Gold except for a white band on either side of the epicranial suture and a white spot in the region of the ocelli. Rim of foramen magnum black. Body length 10 mm. Narrow irregular mid-dorsal line Argus Brown. Lateral line same but wider. Body Vinaceous-Buff, lighter on borders of lateral line and spotted with few irregular spots of Argus Brown. Stigmatal line a faint suggestion of darker background. Areas between dorsal line and lateral line more heavily spotted than elsewhere. Scattered colorless hairs over body. Spiracles cream. Black and white design on anal plate as in Fig. 4.

Eggs laid May 10 and 11 hatched May 17 seven days having elapsed. Moulting into the second instar took place on May 22 the first instar being of five days' duration. The second instar was of four to five days' duration moulting having occurred May 26. The third instar consumed five days with moults May 31. The fourth and fifth instars likewise were of five days' duration each.

Catia misera (Lucas)

Egg.

Height .75 mm. Greatest diameter .82 mm. Egg white, covered with a raised reticulation forming polygonal areas as is usual with the eggs of Hesperinae.

First Instar.

Head height .5 mm.; head width .45 mm. Head black, shiny, very faintly punctate. Few very small whitish hairs. Body length 2 to 3.8 mm. Body light Vinaceous-Buff spotted evenly with Fawn Color spots, more distinct on the posterior segments. Becomes slightly grass green especially at the anterior end after eating. Few scattered hairs on body bulbous at tip. Two pairs of long forwardly recurved hairs on anal segment. Also a pair of shorter backwardly decurved hairs. Claws of first pair of legs slightly fuscous.

Second Instar.

Head height .72 mm.; head width .70 mm. Head shiny black with faintly raised reticulations also shiny. Thoracic legs fuscous. Length of body 4.5 to 5 mm. Body dull grass green thickly mottled with maroon and white. Dull greenish mid-dorsal line. Under side of body dull greenish. Bright orange spot on each segment, segments one and two excepted, at stigmatal line. Short hairs covering body. Those on anal plate longer.

Third Instar.

Head height .8 mm.; head width .78 mm. Head roughly shagreened. Characteristic black and white design of head with greater percentage of black than in following instars (cf. Fig. 13), that is, white bands not so broad. Body length 5 to 7 mm. Body mottled white and dark ferruginous on dull background. Orange spots same as above. Many short black hairs from black tubercles. Legs fuscous.

Fourth Instar.

Head height 1.2 mm.; head width 1.0 mm. Head design as in Fig. 13. Body length 7 to 10 mm. Not much change from previous instar, general effect darker.

The egg stage lasted from seven to ten days. Eggs laid May 6, 7, and 8 hatched May 16; those laid May 9 to 11 hatched May 18; those laid May 19 and 20 hatched May 26 and 29. The first instar was of five to six days' duration with moults occurring in the above three groups May 23, 23, and 31 respectively. The second instar was of four to eight days' duration. The third and fourth instars were of seven days' duration each.

Poanes radians* (Lucas)Egg.*

Height .5 mm.; greatest diameter .75 mm. Pearl white when laid. Later acquires a bright pink design which consists of an irregular circumpolar band and a slightly wider irregular equatorial band. The usual reticulation is present.

First Instar.

Head height .5 mm.; head width .52 mm. Head shiny black, faintly pitted. Body length 2 to 3.5 mm. Claws of

thoracic legs fuscous. Body light Baryta yellow; light green after eating. Two pairs of long forwardly recurved hairs of approximately equal length on anal segment.

Second Instar.

Head height .72 mm.; head width .7 mm. Head dull black, raised reticulations darker than ground work. Lighter in region of epicranial suture. Length of body 4.5 mm. Body yellow green covered with minute black hairs. Dorsal line slightly darker green. A conspicuous black stellate spot on each side of the median line of the anal plate.

Third Instar.

Head height .87 mm.; head width .8 mm. Characteristic brown to piceous head design on yellowish background (cf. Figs. 7 and 9) first appears in this instar. Areas bordering the epicranial and adfrontal sutures are white. Body length 5.5 to 9 mm. Body grass green with many short black hairs. Dull green mid-dorsal line. Spots on anal segment now usually four (Fig. 1).

Fourth Instar.

Head height 1.25 mm.; head width 1.10 mm. Head as in Figs. 7 and 9. Body length 9.5 mm. Similar to foregoing instar.

Eggs laid May 6 to 8 emerged May 13, five to seven days having elapsed. The first instar consumed six days moulting having occurred May 19 and 20. The second instar was of five to twelve days' duration with moulting May 31. The third and fourth instars required ten days each.

Lerodea tripuncta (Herrich-Schäffer)

Fourth Instar.

Head height 1.5 mm.; head width 1.35 mm. Head with a rough raised reticulation and the same characteristic fuscous design on whitish background as in the following instar. Body light green covered with short whitish to brownish hairs.

Fifth Instar.

Head height 1.9 mm.; head width 1.5 mm. Head as in

Fig. 5. Roughly shagreened and covered with many short white hairs. Body length 22 mm. Light green.

Chrysalis.

Length 18 mm. Narrow and generally cylindrical in shape. Anterior end acute. Cremaster long and pointed. Tongue case same length as chrysalis but free from base of wing pads to end. Surface of chrysalis smooth. General color light green. Free portion of tongue case with slight pinkish tinge. Cremaster transparent and colorless at its tip.

Prior to emergence of the adult the dark color of the wings becomes visible as does also the brilliant red of the eyes. The duration of the chrysalis stage is eight days.

Prenes nero sylvicola (Herrich-Schäffer)

Egg.

Height .5 mm. Greatest diameter .75 mm. The eggs range in color from bone white to flesh. The surface is adorned with a raised reticulation forming polygonal cells.

First Instar.

Head height .5 mm.; head width .6 mm. Head piceous, shiny, punctate, and with few whitish hairs. Body length 2 to 4 mm. Yellow on emergence, light green after eating. Covered with a few short brown clavate hairs. Anal plate with two pairs of very short (for this position) recurved hairs.

Second Instar.

Head height .75 mm.; head width .6 mm. First appearance of characteristic head pattern (cf. Fig. 11). Head with raised reticulation and short brownish to colorless hairs. Ground color light yellowish to greenish. Length of body 4.5 mm. Body clear grass green with a dark green mid-dorsal line bordered by a narrow white line. Also thin white paradorsals. Body covered with minute black hairs.

Third Instar.

Head height .9 mm.; head width .9 mm. Dark areas of head pattern more extensive than in following instar (Fig. 11). Minute black hairs covering head. Length of body 6

to 13 mm. Design as in previous instar but more pronounced. Faint indication of a white substigmatal line.

Fourth Instar.

Head height 1.6 mm.; head width 1.5 mm. Head as in Fig. 6. Body length 15 mm. Similar to previous instar.

Eggs laid May 11 to 13 emerged May 15 and 16 three to five days having elapsed. The first instar consumed from four to eight days with moults May 19 and 23. The second instar required five days with moults May 28. The third instar was of four days' duration.

***Prenes nyctelius coscinia* (Herrich-Schäffer)**

Second Instar.

Head height 1.6 mm.; head width 1.5 mm. Head with raised reticulations and the characteristic design seen in all the following instars (cf. Fig. 8). Body green covered with minute brown hairs.

Third Instar.

Head height 2.1 mm.; head width 2.0 mm. Roughly punctate, otherwise similar to previous instar. Body length 12 mm. Body covered with many short black hairs. First four segments Sorrento Green. Remainder of body Opaline Green. Stigmatal line Opaline Green.

Fourth Instar.

Head height 2.6 mm.; head width 2.5 mm. Similar to previous instar. Body length 18 to 20 mm. Same as above.

Fifth Instar.

Head height 3.2 mm.; head width 3.0 mm. Head roughly punctate. Design as in Fig. 8. Dark areas fuscous; light areas Reed Yellow. Body length 25 to 28 mm. Body Water Green.

Chrysalis.

Length 21 mm. Covered with short brown hairs except on head and dorsal areas where the hairs are considerably longer, those on head being the longest. Tongue case reaches only to sixth abdominal segment. It is free only at the last

segment. Cremaster short and blunt. General ground color dead grass yellow. Eyes, mouthparts, cremaster, and tip of tongue case light brown. Two brown spots on pronotum.

When about to pupate the mature larva becomes dead grass yellow and spins a loose cocoon in the grass. Larvæ which pupated May 18 emerged May 27 nine days having elapsed.

CLASSIFICATION

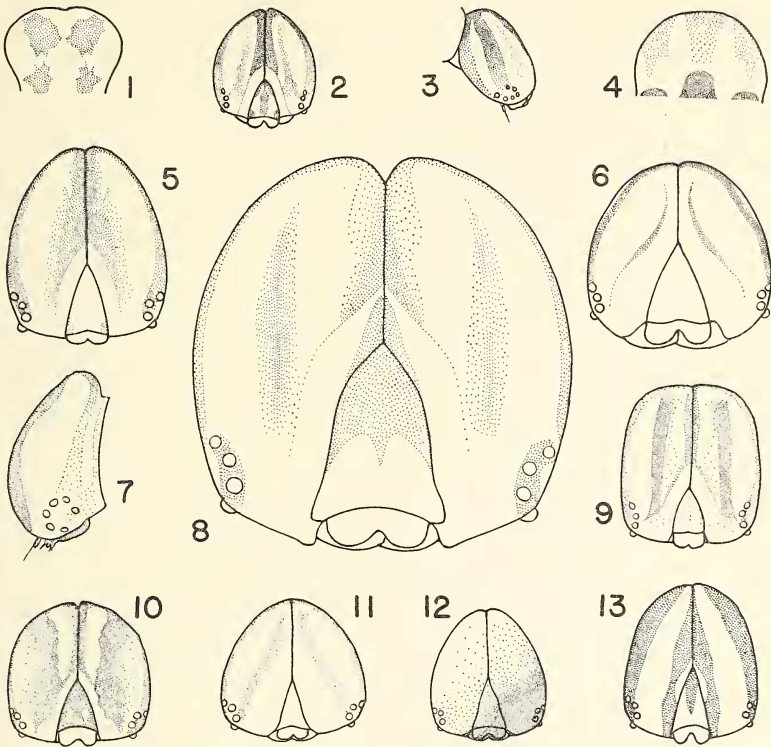
Although the extent of our knowledge of larval Hesperiiinæ in Cuba does not yet permit of a workable key to the different species, it already holds more than fair promise for one at a later date.

All of the forms now described may be identified by the characteristic head pattern or the color of the head of the later instars. For this the moulted head capsule is adequate.

It will be found that the larvæ may be divided into two groups, those with a color pattern on the head and those without. The patterns are sufficiently constant within the species to enable one to separate them by referring to Plate IX. *Polites baracoa* and *Poanes radians* may further be identified by the color pattern on the anal plate. *Catia misera* is characterized by dark ferruginous mottling. In this respect it closely resembles *Catia otho*. Two species are known in which the head lacks any definite pattern. One, *Calpodes ethlius*, may be distinguished by its dark orange head; *Hylephila phyleus*, the other, by its dark brown to black head.

LITERATURE CITED

- Bates M., 1935. The butterflies of Cuba. Bulletin of the Museum of Comparative Zoölogy, 78 (2): 61-258.
- Gundlach, J., 1881. Contribución á la entomología cubana. (Vol. 1, Lepidoptera). Havana.
- Ridgway, R., 1920. Color standards and color nomenclature. Washington, D. C.



- Fig. 1. Color pattern on the dorsal side of the anal segment of *Poanes radians* (Lucas).
 Fig. 2. Front view of the head of *Lerodea eufala* (Edwards).
 Fig. 3. Lateral view of the same.
 Fig. 4. Color pattern on the dorsal side of the anal segment of *Polites baracoa* (Lucas).
 Fig. 5. Front view of the head of *Lerodea tripuncta* (Herrich-Schäffer). Last instar.
 Fig. 6. Front view of the head of *Prenes nero sylvicola* (Herrich-Schäffer). Fourth instar.
 Fig. 7. Lateral view of the head of *Poanes radians* (Lucas). Fourth instar.
 Fig. 8. Front view of the head of *Prenes nyctelius coscinia* (Herrich-Schäffer). Last instar.
 Fig. 9. Front view of the head of *Poanes radians* (Lucas). Fourth instar.
 Fig. 10. Front view of the head of *Polites baracoa* (Lucas). Fourth instar.
 Fig. 11. Front view of the head of *Prenes nero sylvicola* (Herrich-Schäffer). Third instar.
 Fig. 12. Front view of the head of *Hylephila phylcus* (Drury).
 Fig. 13. Front view of the head of *Catia miseru* (Lucas). Fourth instar.